De beoordeling van arseenhoudende insecticiden

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SUMMARY.

After a general introduction including some entomological and economic details in the first part of this paper entitled „the investigation of arsenical insecticides", volumetric methods for the chemical determination of arsenic in insecticides are discussed.

1. Arsenic present in the trivalent form may be determined by oxidation methods using a standard iodine, potassium bromate or potassium iodate solution as oxidizing agent respectively. Iodine and bromate methods have proved to be the most useful.

2. For the determination of arsenic present in the pentavalent form only the iodimetric method is considered. But not being applicable in the presence of ferric iron, it is not of much use in insecticide analysis. So pentavalent arsenic may be estimated as the difference between the total and the trivalent arsenic.

3. Total arsenic may be determined by several methods:

a. by distillation as arsenious chloride adding hydrazine sulfate as a reducing agent and titration of the distillate with potassium bromate.

b. by precipitation as arsenious iodide and titration of this with iodine.

c. by reduction (without a distillation or precipitation) by means of (1) hydrazine sulfate, (2) sodium thiosulfate, (3) sulfur or (4) hydroiodic acid and titration of the arsenious oxide formed with potassium bromate or with iodine (in the last case only).

d. by reduction by means of (1) hypophosphorous acid or (2) stannous chloride to metallic arsenic and titration of this with iodine.

Methods mentioned under *a*, *b*, *c* (1) and *d* (1) are of rather general applicability and may be recommended especially.

Investigations have been made, if the presence of the metals

calcium, copper, iron, mercury, manganese, lead or zinc does not interfere with the methods described. If so, special methods have to be applied particularly in the case of copper, iron and mercury.

In the last chapter of the paper methods for the determination of the degree of fineness or particle size of insecticides by sifting, sedimentation and optical means are discussed. For practical use microscopic examination using for comparison a micrometer ocular or some standard powder of known particle size, the sulfurimeter method and the estimation of volume weight proved to be the most convenient.

Procedures for the determination in insecticides of total arsenic (arsenic present in the trivalent and pentavalent form apart if possible), of water-soluble arsenic and of the degree of fineness were stated in detail. In every special case the choice of chemical methods should be governed by the composition of the insecticide to be analyzed.

Attempts have been made to set up standard requirements for the three prominent arsenical compounds Paris green, lead arsenate and calcium arsenate.